

AMENDMENT IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Process for the production of covalently cross-linked bacteriorhodopsin comprising reacting ~~characterized in that bacteriorhodopsin is reacted~~ in a membrane-bound form as a substrate of a transglutaminase to become ~~and is~~ covalently cross-linked thereby.
2. (Currently Amended) Process as claimed in claim 1, wherein ~~characterized in that~~ bacteriorhodopsin is reacted in the purple membrane form as a substrate of a transglutaminase and is covalently cross-linked thereby.
3. (Currently Amended) Process as claimed in claim 1 or 2, wherein ~~characterized in that~~ identical or different bacteriorhodopsins or bacteriorhodopsin variants are cross-linked with one another.
4. (Currently Amended) Process as claimed in claim 3, wherein ~~one of the previous claims, characterized in that~~ the bacteriorhodopsin is selected from wild-type bacteriorhodopsin or/and bacteriorhodopsin variants.
5. (Currently Amended) Process as claimed in claim 3, wherein ~~one of the previous claims, characterized in that~~ at least one bacteriorhodopsin variant is ~~reacted which~~ is a membrane protein that is structurally related to bacteriorhodopsin ~~and is in particular halorhodopsin or/and sensorrhodopsin in a membrane bound form.~~
6. (Currently Amended) Process as claimed in claim 3, wherein ~~one of the previous claims, characterized in that~~ at least one bacteriorhodopsin variant is ~~reacted which~~ has a modified amino acid sequence compared to the wild-type bacteriorhodopsin or/and in

which retinal is replaced by a retinal-like molecule or/and is chemically modified or/and modified by enzymatic treatment.

7. (Currently Amended) Process as claimed in claim 6, wherein ~~characterized in that~~ at least one bacteriorhodopsin variant ~~is reacted which~~ contains only a single binding site for transglutaminase.
8. (Currently Amended) Process as claimed in claim 6, wherein ~~characterized in that~~ at least one bacteriorhodopsin variant ~~is reacted which~~ contains two binding sites for transglutaminase which are not on the same side of the membrane.
9. (Currently Amended) Process as claimed in claim 3, wherein ~~one of the previous claims, characterized in that~~ the cross-linking reaction is stopped by briefly heating to 80°C or above.
10. (Currently Amended) Process as claimed in claim 1 ~~one of the previous claims,~~ characterized in that a bacterial transglutaminase is used.
11. (Currently Amended) Process as claimed in claim 3, wherein ~~one of the previous claims, characterized in that~~ a transglutaminase is used which is active without a cofactor.
12. (Currently Amended) Process as claimed in claim 3, wherein ~~one of the previous claims, characterized in that~~ the bacteriorhodopsin is cross-linked with a polymer, a surface or/and an auxiliary substance.
13. (Currently Amended) Process as claimed in claim 12, wherein ~~characterized in that~~ the auxiliary substance is selected from the group ~~comprising~~ consisting of dyes, fluorochromes, lipids, peptides, nucleic acids, synthetic oligomers and polymers, proteins, lectins, polysaccharides and conductive molecules.

14. (Currently Amended) Linker-free, covalently cross-linked bacteriorhodopsin made by the process of claim 3 ~~obtainable by one of the previous claims.~~
15. (Currently Amended) Process for a photoelectric application, comprising using ~~Use of~~ the linker-free, covalently cross-linked bacteriorhodopsin as claimed in claim 14 in a photoelectric application ~~for photoelectric applications.~~
16. (Currently Amended) Process for three-dimensional data storage, comprising using ~~Use of~~ the linker-free, covalently cross-linked bacteriorhodopsin as claimed in claim 14 in ~~for~~ three-dimensional data storage.
17. (New) Process as claimed in claim 3, wherein the membrane protein is halorhodopsin or/and sensorrhodopsin in a membrane-bound form.